

FIG. 1

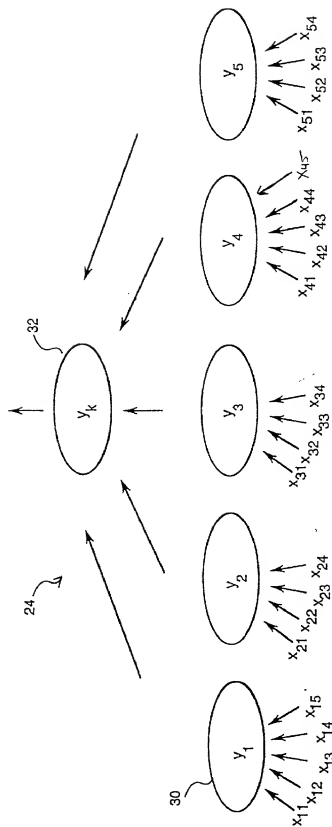


FIG. 2

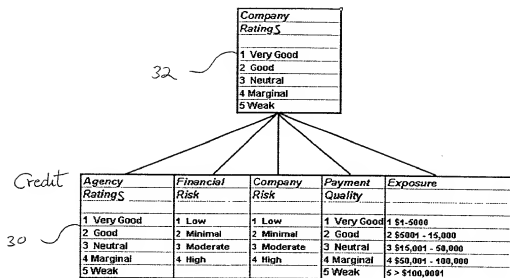


FIG. 3

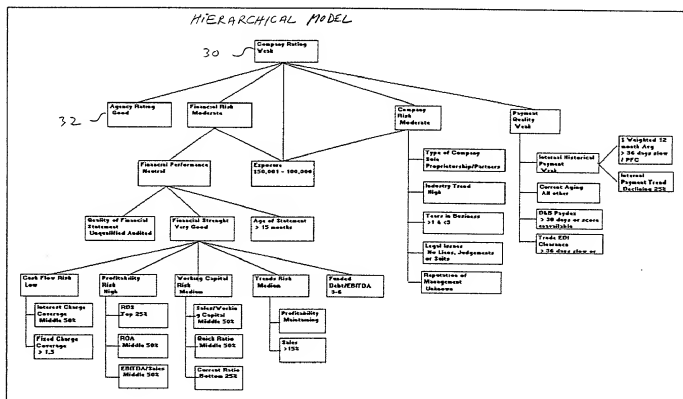


FIG. 4

D&B Mapping of Raw Data (e.g., from D&B) for Credit Agency Ratings

1 Very Good	2 Good	3 Neutral	4 Marginal	5 Weak
5A1	3A2	5A3	BB3	5A4
5A2	2A1	4A3	CB3	4A4
4A1	2A2	3A3	CC3	3A4
4A2	1A1	2A3	DC3	2A4
3A1	1A2	1A3	DD2	1A4
	BA1	BA3	EE2	BA4
	BA2	DC2	FF2	BB4
	CB1	DD1	GG2	CB4
	CB2	EE1	HH2	CC4
	CC1	FF1	IR2	DC4
	DC1	GG1	IR2	DD3
		HH1		DD4
			NL	EE3
			--	EE4
			NQ	FF3
			ER1	FF4
			ER2	GG3
			ER3	GG4
			ER4	HH3
			ER5	HH4
			ER6	IR3
			ER7	IR4
			ER8	IR3
			ERN	IR4

FIG 5

Payment Quality
1 Very Good
2 Good
3 Neutral
4 Marginal
5 Weak

Internal Historical Payment	Current Aging	D&B Paydex relative to industry average	Trade EDI Clearance
1 Very Good	1 All other	1 < 10 days slower	1 < 10 days slow
2 Good	2 >25% >30 days p/d	2 11-30 days slower	2 10-20 days slow
3 Neutral	3 >10% >60 days p/d	3 > 30 days or score unavailable	3 21-30 days slow
4 Marginal			4 31-35 days slow
5 Weak			5 ≥ 36 days slow or PFC

FIG. 6

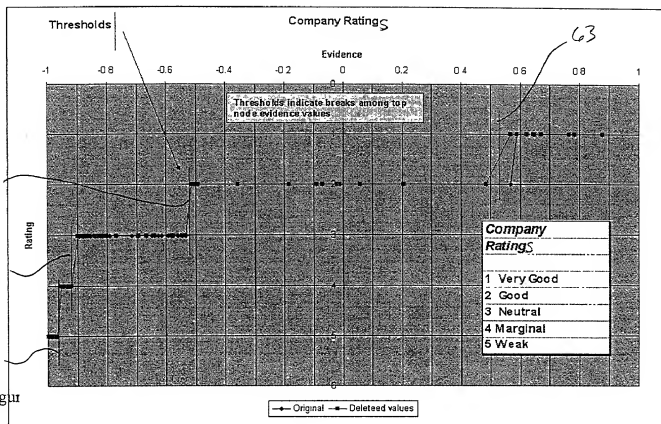


FIG. 7

16

30

32

Company Rating

Agency Rating	Financial Risk	Company Risk	Payment Quality	Exposure	Company Rating
1 Very Good	1 Low	1 Low	1 Very Good	1 \$11,500K	1 Very Good
2 Good	2 Minimal	2 Minimal	2 Good	2 \$2001 - 15,000	2 Good
3 Neutral	3 Moderate	3 Moderate	3 Neutral	3 \$15,001 - 50,000	3 Neutral
4 Marginal	4 High	4 High	4 Marginal	4 \$50,001 - 100,000	4 Marginal
5 Weak			5 Weak	5 > 100,000	5 Weak

Create a statistical sample of the possible hypothetical cases

Expert supplies his opinion or diagnosis

Used as input to machine learning technique

Case	Agency Rating	Financial Risk	Company Risk	Payment Quality	Exposure	Company Rating
606	2	2	1	1	1	1
1921	5	1	1	1	1	1
1547	4	1	3	1	2	2
1717	5	2	1	2	2	2
250	1	2	3	2	2	2
1952	5	1	3	1	2	2
152	1	2	2	1	1	1
491	2	3	2	1	2	2
1453	5	1	2	2	1	1
508	2	2	4	2	2	2
1897	3	3	4	4	2	2
120	1	2	2	2	2	2
760	2	4	3	2	2	2
25	1	1	1	1	5	5
1281	4	2	4	2	1	1
107	1	2	1	1	2	2
1156	3	4	3	2	1	1
1889	5	2	4	1	5	5
105	2	2	4	1	5	5
531	2	2	4	1	1	1
142	1	2	2	4	2	2
1921	5	4	1	5	4	4
1264	4	2	3	3	4	4
646	2	3	2	2	1	1
1704	5	2	1	1	1	1
1123	3	4	1	5	3	3
212	1	4	1	2	2	2
554	2	1	3	1	4	4
63	1	1	3	4	4	4
344	3	2	2	5	1	1

FIG. 8

Evidence Modeling

Evidence matrix associates an evidence value with each risk element value

Company Rating

Agency Rating	Financial Risk	Company Rating	Payment Counter	Exposure
1 Very Good	Low	1 Low	1 Very Good / 155,000	
2 Good	Normal	2 Normal	2 Good / 16,000	
3 Marginal	Marginal	3 Marginal	3 Marginal / 150,000 - 50,000	
4 Marginal	Marginal	4 Marginal	4 Marginal / 150,000 - 10,000	
5 Weak	High	5 Weak	5 Weak / 100,000	

Agency Rating	Financial Risk	Company Rating	Payment Counter	Exposure
1 Very Good	Low	1 Low	1 Very Good / 155,000	
2 Good	Normal	2 Normal	2 Good / 16,000	
3 Marginal	Marginal	3 Marginal	3 Marginal / 150,000 - 50,000	
4 Marginal	Marginal	4 Marginal	4 Marginal / 150,000 - 10,000	
5 Weak	High	5 Weak	5 Weak / 100,000	

0.181	0.074	0.025	0.547	0.254
0.081	0.183	0.061	0.447	0.021
-0.074	-0.784	-0.055	-0.059	0.021
-0.074	-0.48	-0.547	-0.478	-0.018
-0.054	0.002	0.081	-0.009	-0.018

Case	1	2	3	4	5
1001	1	1	1	2	2
1002	5	1	1	2	1
1003	6	1	2	2	1
1004	4	1	1	2	4
1005	1	1	1	2	2
1006	5	1	2	2	2
1007	1	2	2	2	2
1008	2	2	1	2	2
1009	2	1	1	3	2
1010	2	1	1	4	1
1011	1	1	2	1	0
1012	2	3	1	2	1

Case	1	2	3	4	5
1001	1	1	1	2	2
1002	5	1	1	2	1
1003	6	1	2	2	1
1004	4	1	1	2	4
1005	1	1	1	2	2
1006	5	1	2	2	2
1007	1	2	2	2	2
1008	2	2	1	2	2
1009	2	1	1	3	2
1010	2	1	1	4	1
1011	1	1	2	1	0
1012	2	3	1	2	1

Cumulative evidence for an example defines goodness of top node

0.555	0.181	-0.182	0.025	0.547	0.021
0.244	-0.054	0.074	0.061	0.447	0.021
-0.244	0.181	-0.182	-0.055	-0.059	0.021
-0.055	-0.055	-0.182	0.025	0.447	0.021
-0.055	-0.055	0.074	0.025	-0.059	0.021
-0.055	0.181	0.074	0.025	-0.478	0.021
-0.055	0.181	0.074	0.025	0.447	-0.018
0.000	0.061	-0.784	0.025	0.547	0.254

Evidence Combination Rules

- $e = e_1 + e_2 (1 - e_2)$ if $e_1 > 0$ and $e_2 > 0$
- $e = e_1 + e_2 (1 + e_1)$ if $e_1 < 0$ and $e_2 < 0$
- $e = 0$ if $e_1 = 0$ and $e_2 = 0$
- $e = (e_1 + e_2) / [1 - \min(|e_1|, |e_2|)]$ Otherwise

Evidence values range from 1 (good) to -1 (bad)

	1	2	3	4	5
MIN	0.5878	-0.5139	0.8994	-0.9542	-0.9979
MAX	0.9778	0.9778	0.9778	0.9778	0.9778
Thresholds	0.577781	0.522219	0.90942	0.90942	0.90942
Separation	0.000000	0.000000	0.000000	0.000000	0.000000
Total Separation	0.000000	0.000000	0.000000	0.000000	0.000000
Std Dev	0.000000	0.000000	0.000000	0.000000	0.000000
Scale factor	0.000000	0.000000	0.000000	0.000000	0.000000
Mean	0.000000	0.000000	0.000000	0.000000	0.000000

Thresholds indicate breaks among top node evidence values

FIG. 9

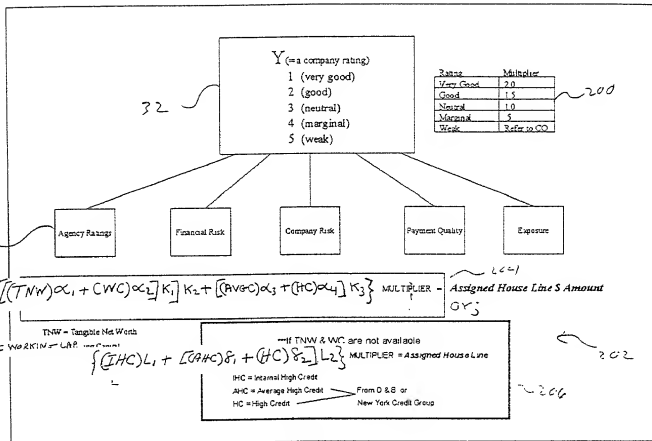


FIG. 10

Figure 7

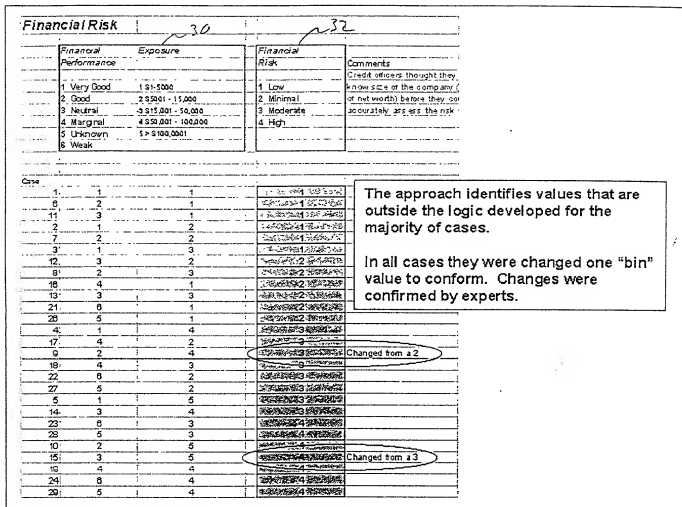


Figure 8

COMPANY RISK

Low
Minimal
Moderate
High

Type Of Company

• Type C
• Sole Proprietorship
• Partnership
• Type S
• LLC
• Unknown

Industry Trend Risk
(SIC Codes)

• Low
• Moderate
• High

Years In Business

• > 3 Years
• 1 Year & < 3 Years
• < 1 Year

Legal Issues

• No Laws Judgements or Suits
• Laws, Judgements or Suits
• IRS Tax Laws

Reputation
Of Management

• Low
• Unknown
• Negative

Exposure*

• \$1-\$5000
• \$5001-\$15,000
• \$15,001-\$50,000
• \$50,001-\$100,000
• > \$100,000

FIG. 12

Description: Test Case 4

Inputs	
\$ Weighted 12 month Avg	2 11-20 days slow
Internal Payment Trend	2 24% to 24% (or Unknown)
Sales/Working Capital	2 Middle 50%
Quick Ratio	2 Middle 50%
Current Ratio	2 Middle 50%
Profitability	3 Down > 10%
Sales	4 Declining
ROS	3 Bottom 25%
ROA	3 Bottom 25%
EBITDA/Sales	3 Bottom 25%
Agency Rating	4 Marginal
Exposure	5 \$100,000
Type of Company	1 Type C
Industry Trend	1 Low
Years in Business	1 > 3
Legal Issues	1 No Liens, Judgements or Suits
Reputation of Management	3 Checkered
Quality of Financial Statement	1 Unqualified Audited
Age of Statement	1 < 6 months
Funded Debt/EBITDA	3 > 6 or < 0
Fixed Charge Coverage	1 > 1.5
Interest Charge Coverage	3 Bottom 25%
Current Aging	1 All other
D&B Paydex	2 11-30 days slower (or Unknown)
Trade EDI Clearance	2 10-20 days slow

Run Model

Company Rating: Marginal

Net Worth: \$0

Working Capital: \$11,000

Avg. High Credit: \$200,000

Internal High Credit: \$150,000

Base Credit Line: \$100,000

Multiplier: 0.5

House Line: \$54,000

FIG. 13

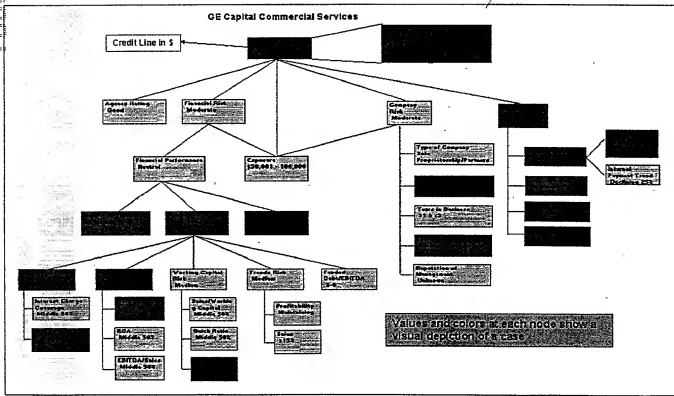


FIG. 14

GE Capital Commercial Service		Test Case 4	
House Law		\$54,000.00	
The Overall Company Rating of:		Marginal	
Was based on:			
An Agency Rating of		Marginal	
A Financial Risk of		High	
An Exposure of		> \$100,000†	
A Company Risk of		Moderate	
A Payment Quality of		Good	
The Financial Risk of			
Was based on:		High	
A Financial Performance of		Marginal	
An Exposure of		> \$100,000†	
The Company Risk of			
Was based on:		Moderate	
A Type of Company of		Type C	
An Industry Trend of		Low	
Years in Business of		*3	
Legal Issues of		No Liens, Judgements or Suits	
A Reputation of management of		Checked	
The Payment Quality of			
Was based on:		Good	
An Internal Historical Payment of		Good	
A Current Aging of		All other	
A D&B Paydex of		11-20 days slower (or Unknown)	
A Trade EDI of		10-20 days slow	
The Internal Historical Payment of			
Was based on:		Good	
A Weighted Monthly Average of		11-20 days slow	
A Payment Trend of		24% to -24% (or Unknown)	
The Financial Performance of			
Was based on:		Neutral	
A Quality of Financial Statement of		Unqualified Audited	
A Financial Strength of		Very Good	
An Age of Statement of		> 15 months	
The Financial Strength of			
Was based on:		Very Good	
A Cash Flow Risk of		Low	
A Profitability Risk of		High	
A Working Capital Risk of		Medium	
A Trends Risk of		Medium	
A Funded Debt/EBITA of		3-8	
The Cash Flow Risk of			
Was based on:		Low	
An Interest Charge Coverage of		Middle 50%	
A Fixed Charge Coverage of		> 1.5	
The Profitability Risk of			
Was based on:		High	
A ROS of		Top 25%	
A ROA of		Middle 50%	
An EBITA/Sales Ratio of		Middle 50%	
The Working Capital Risk of			
Was based on:		Medium	
A Sales/Working Capital Ratio of		Middle 50%	
A Quick ratio of		Middle 50%	
A Current Ratio of		Bottom 25%	
The Trends Risk of			
Was based on:		Medium	
A Profitability of		Maintaining	
A Sales of		>15%	

FIG. 15